

EDGE

Leading edge hardware

An authoritative
supplement, courtesy
of **Edge** issue 8

3DO

Jaguar

CD32

CD-i

Sega Saturn

Sony PS-X

**Nintendo
Project Reality**

Leading
edge
hardware

inside **EDGE** supplement

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The interactive entertainment industry has a turbulent time ahead of it. What do the new technologies mean for you, the poor consumer?

Progress is inevitable. The past few months have seen some stunning 16bit titles, and the potential of the Mega Drive and SNES is just starting to be exploited, but the march of technology moves on regardless. All eyes are now fixed firmly on the future. The videogame industry is united in an ungainly struggle to abandon contemporary formats and their diminishing profitability, in the search for new champions.

Perhaps everyone has finally tired of the seemingly inexhaustible supply of insubstantial shoot 'em ups, dreary platform games and tedious beat 'em ups, and is expecting a fresh batch of hardware to make up for deficiencies in the current software crop. Perhaps the industry is over-eager to embrace the money-making opportunities afforded by a new technology, and will press on with the development of new systems regardless of their necessity. Whatever the reasons, the battles to define the next generation of videogame hardware have been well and truly joined.

The sparring has recently come to a head for the consumers, and left their wallets caught hazardously in the 'next generation' crossfire. Just as the 3DO and Jaguar appeared, when no-one really believed that they would, Nintendo announced their link-up with Silicon Graphics to →



Atari's *Chequered Flag 2*, soon to appear on the Jaguar

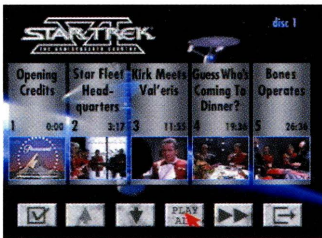
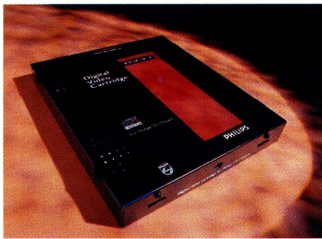
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1994



The advent of affordable digital video could herald a new era of interactive entertainment. *Star Trek VI* leads the revolution...

← produce a 64bit console; Sega released details of the 32bit Saturn, and Sony stormed onto the scene with news of their powerful Play Station-X. How about the TXE Multi System? The Neo-Star? And hasn't CD-i still got a chance?

There's no question that there are going to be losers in the forthcoming struggle, and you need only talk to anyone who invested in a Betamax video recorder to discover how it feels to have backed the wrong horse in the technology derby – although they would be unlikely to respond to your enquiry with any degree of politeness.

It's important, then, to have a guide – a routefinder through the labyrinthine complexity of the burgeoning videogames market, and that's why we've assembled this supplement. Some of the contenders are unknown quantities, but the available details have been distilled into a straightforward index of the major players. In addition, by examining the trends that will be influencing the market as it develops over the next few years, we hope to give some indication of each machine's relative chances of success – or failure.

Now, think about the future. What do you see? The shiny star of Compact Disc, bringing about a new dawn of interactive entertainment? Or the evil spectre of Compact Disc, its lethargic accessing times and tendency towards extravagant presentation destroying the notion of 'gameplay'? Whether we embrace it or not, the advent of CD as a medium for computer games has become a fundamental issue.

The implications appear so simple: improved data capacity should equate simply to bigger games, better sound and more impressive graphics. The difficulty has arrived with the thorny development of 'multimedia'.

'Multimedia' is currently a terribly problematic word: opinions differ on its precise meaning or application, but it is generally accepted to stand for some new kind of market that will develop a mass consumer potential over the next couple of years. It comprises an amalgam of digital video, CD-quality audio, photorealistic graphics, animations and text, intermingled with an as yet undefined element of 'interaction'. But is it a new form of entertainment? An information manager? A games medium? The trouble is, no-one seems to know what form consumer acceptance of the technology will take.

The function of CD as a multimedia tool has yet to be defined; indeed, many observers are sceptical that its promised appeal will ever catch the public imagination. Certainly, early efforts – CDTV and CD-i – got off to rather shaky starts. But the arrival of the 3DO, with major industry players signalling a clear commitment to Trip Hawkins' 32bit console, lends new credence to the multimedia dream. Agreement on a digital video standard,

with MPEG compatibility now an option for CD-i, 3DO, PC and CD³², and the catalogue of feature films available on CD growing all the time, has made the prospects for an 'all-in-one' player ever more attractive.

Whether the demand for such a device will finally materialise or not, the videogames industry is being catapulted into catering for this market by the sheer momentum of the money that's being stacked up behind it. The 'multimedia dream' may turn out to be of no real benefit to the consumer, but the opportunities for the rapidly emerging entertainment conglomerates are too much for them to resist.

The process of defining the future of home

entertainment – with all the lucrative offshoots such homogenisation will create – is now taking place at the cutting edge of console technology. It's the natural place to start; the 'interactivity' that is likely to be a key element of the new medium is already an integral part of the videogame.

It's only since Philips began to concentrate on their leisure titles, for instance, that the

CD-i player has become a competitive mass-market proposition. When they were approaching the multimedia question from a textual angle, with discs that were little more than moving picture books, CD-i offered nothing that a consumer could relate to. Now, however, it can play cool games. And as a value-for-money extra, you can listen to your CDs on it. And you can watch films with CD-quality sound and perfect freeze-frame.

As our industry becomes the launchpad for new forms of entertainment, this sudden influx of money and hardware is distancing the consoles from their intended purpose – to play games. It's difficult to predict how much the software we are playing next year will have been compromised by the onslaught of multimedia, but a distinctly mixed bag of games on CD has suggested some alarming possibilities.

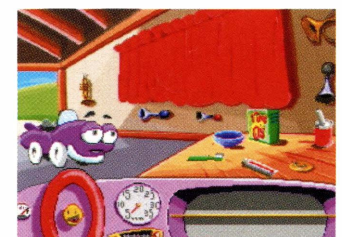
All too often, the sensational aspects of the new medium – full-motion video, pre-rendered graphics and studio-recorded soundtracks – have failed to mask an unexciting and heavy-handed approach to the games beneath them. This could simply be put down to developers' lack of experience with CD; an initial period of experimentation, it could be argued, is only to be expected. But the trend has yet to be reversed, and has highlighted some problems that are going to affect the development of all games on the format, even if hardware

'It's a new world. In about five years, CD-ROM is going to

absorb entertainment,

education and information'

Peter Gabriel, multimedia artist



3DO goes all 'edutainment' with *Putt-Putt Joins The Parade*

Edge supplement



Putting the 'video' into 'videogame' – the digitised film footage of *Voyeur* on the CD-i

'There will soon be total FMV

games, with no rendered

imagery, that can be played

through in around an hour'

Robbie Henderson, Creative Director, Storm

specifications are beefed up to improve access speed.

Not the least of these problems is the expense incurred in filling the 650Mb of space on a CD. If, as we are led to believe, the future lies with the extravagant production values of, say, *Microcosm*, *Ground Zero Texas* or *Rebel Assault*, then the small idiosyncratic teams of programmers and designers that have made videogame history so exciting and varied are inevitably going to be unable to compete. Without the resources of movie studios and workstations, many of the most fertile development groups are going to be absorbed into the corporate soup of 'entertainment product'.

With marketing, packaging and mass-market appeal becoming such important factors in a game's success, we have come a long way from the days when enthusiasts constructed their own computers, and coded their own games. The benefits, of course, are undeniable, and the polished opulence of the new software is extremely attractive, although vastly more expensive.

But as the industry becomes part of the mainstream, so the games are being watered down. Expensive games require serious returns, so we get a lavish but very average effort like *Microcosm*, for example, released onto every imaginable format. Aside from the diminishment of choice and variety, the question of value-for-money rears

its head. Beneath the gloss it's only another shoot 'em up – just as *The 7th Guest* is only

another adventure-cum-puzzle game.

Of course, it's never too late to turn things around, and following the disastrous fate of the Mega CD – under-specced, over-priced and under-exploited as it was – the hardware manufacturers are now more wary in their approach to Compact Disc.

Sega are committed to the format but Nintendo, notoriously sceptical of the medium, have made significant inroads into high-density cartridge development. 3DO may be striding courageously into the CD revolution, with CD³² and CD-i in the vanguard, but Atari, too, are extremely

cautious. Their Jaguar console is defiantly cartridge-based; the CD add-on, arriving later on this year, smacks of fence-sitting tokenism.

Where does this

leave the multimedia dream? Trip Hawkins has struck out boldly with 3DO, in a passionate attempt to explore CD as a whole new way of approaching home entertainment. Atari, meanwhile, are adopting a conservative 'wait and see' approach, content

to play *Tempest 2000* and talk about the good old days of 'classic gameplay'. It's quite possible they're correct.

But the time must one day come when all this talk – of multimedia, of connectivity, of interaction – comes to fruition; when the application of the technology becomes apparent, at the right price. Atari's press releases have made it clear that they are confident the Jaguar will be there when the time comes, but with ever more powerful machines looming, the future is anything but certain.

The hardware market is erupting into a uniquely promiscuous phase of innovation and development, with each new announcement serving to cloud our view of the future. Console gaming is progressing far in advance of the Sega/Nintendo status quo.

Apart from the heavyweight prospect of Sony's PS-X, which is likely to make its mark no matter how confused the market becomes, contestants for our cash and loyalty now include the TXE Multi System, the updated NEC Tetsujin and the 32bit Neo-Star. All will have their followers, although selective distribution and limited marketing in this country will restrict their appeal.

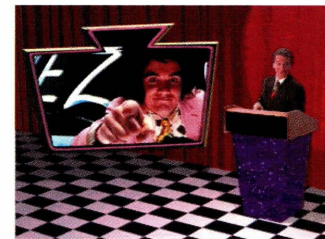
The 32bit TXE machine is aimed at the huge Eastern market for karaoke, but is also capable of hosting some remarkable games software. NEC's offering has been developed from the 32bit CD-based hardware system they unveiled some 18 months ago, but never released. It's now been upgraded to compete with emerging competition from Sega and Sony, and is scheduled for a launch in the last quarter of 1994.

To further complicate matters, SNK have recently announced the Neo-Star, a 32bit 'sequel' to the powerful but grotesquely expensive Neo-Geo. Fully expandable, with support for a keyboard and modem, it's bound to be an impressive piece of kit, but if the cost is comparable to the Neo-Geo, it will remain a high-end system for prosperous connoisseurs.

All three of these machines are unlikely to succeed in the UK, although their chances are more appreciable in the complex Japanese markets from which they originate. Their appearance merely serves to highlight the impenetrability of the developing hardware turmoil.

It's comforting, then, that you've got **Edge**, to shine the torchlight of common sense across the attic spaces of modern technology. We've reached an exciting moment in the development of our industry; but the restless innovation of technology will never cease. Buy a 3DO today, and it'll be out-evolved tomorrow. As soon as you take delivery of a Project Reality console, no doubt PS-X 2 will become the new state of the art...

But stay with **Edge** and you'll always be well-informed. And in these uncertain times, you can't ask for more than that.



Twisted, soon to appear on the 3DO, is a multimedia showcase disguised as a game show

What does it all mean?

A brief guide to some common abbreviations:

CPU: Central Processing Unit.
RISC: Reduced Instruction Set Computer. An advanced form of microprocessor, more efficient than its predecessors.
MIPS: Millions of Instructions Per Second. A measurement of processor speed.
FMV: Full-motion video. Digitised images moving at a rate of 25 frames per second or higher.
MPEG: Motion Picture Experts Group: an accepted standard for digital video compression. MPEG1 has already been implemented, but products are now being designed with the more advanced MPEG2 protocol in mind.
DSP: Digital Signal Processor.

3DO



The multimedia dream comes one step closer to reality with the Panasonic REAL Multiplayer

slow to load. But with a commitment to further hardware price cuts this year, together with talk (already) of an upgraded but fully compatible system appearing early in 1995, 3DO seems to have a better grip on the future than anyone else at the moment.

The 3DO has yet to see a flawless game. *Crash*

'n' Burn is well-designed but

limited; *Total Eclipse* is

impressive, but let down by

some idiosyncratic lapses in playability. *Mad Dog McCree* is

rubbish; *Battlechess* unplayably slow. *Night Trap* is, well,

Night Trap (ie: not very good at

all) and *Stellar 7* is dull. So much

for the first wave.

But this isn't the first time that a new piece of hardware has been let down by its software – and it

certainly won't be the last. The

humble Mega Drive was in

exactly the same position three

years ago, until *John Madden Football* and *Sonic The*

Hedgehog finally gave us a taste of 16bit potential.

Curiously, a reprise of *John*

Madden's playability – with

updated visuals and all the CD

trickery you could wish for – could just be the saviour of

this new pretender. The 3DO version of EA's classic

sports game is unequivocally stunning.

And then? Well, anything's possible, now the big

Japanese developers are involved – Capcom have

promised an upgraded *Street Fighter II*, for example. In the

shorter term, *Theme Park*, *Road Rash*, *FIFA Soccer* and *Mega*

Race are all looking rather smart.



The 3DO standard had only to leap two hurdles, if it was to clinch the winner's medal in the Multimedia Steeplechase before most of the contenders had even left their starting blocks. Sailing gaily over the first, as the Panasonic hardware appeared in US stores on October 1st exactly as promised, 3DO collided head-first with the second, an inexcusable lack of software leaving it lying on the track in an ungainly heap.

Despite the inevitable industry backlash, however – made all the more biting as news emerged of Sega and Sony's plans to supersede it with their own technologies – 3DO appears to have dusted itself down, and continued unperturbed in its race to define a standard for a new generation of videogames.

There are some extremely major forces at work here; not least the heavyweight firms that have lined up in support of the system. Matsushita, Time Warner, AT&T and Electronic Arts all have stakes in the 3DO Company, and over 550 developers are signed up to produce software. Driven by such industry muscle, it's going to take some awfully powerful brakes to stop this bandwagon.

That's not to say the machine is without its problems. Much work has yet to be done to optimise the CD drive's performance – 3DO games have so far been desperately

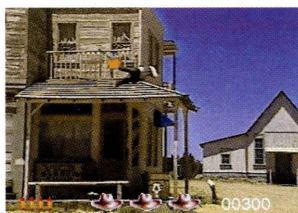
'The technology is good enough

to take a sufficient leap

forward at a reasonable price.

I know it's going to work'

Trip Hawkins, CEO of the 3DO Company



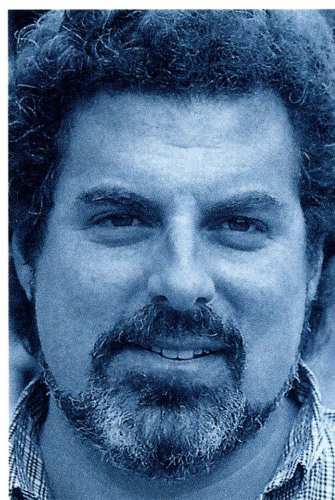
The quality of 3DO's initial batch of software was not improved by full-motion video failures *Night Trap* and *Mad Dog McCree*



Slick, colourful and relentlessly playable, *Total Eclipse* proves that the machine is capable of producing some formidable games

← As investors in the 3DO Company,

Electronic Arts are clearly committed to improving the quality of software for the machine. **Edge** talked to Senior Vice President **Mark Lewis** about the prospects for 3DO software, and EA's hopes for the platform.



EA's Mark Lewis: 'We're trying to be the MTV of interactivity'

Edge What innovative features does the 3DO bring to the new versions of EA's established titles?

ML This is the first piece of 32bit hardware that allows us to incorporate the production techniques of television and Hollywood. The core gameplay is there, but thrown into the stew is animation, music and studio talent that exploits the hardware. I've had *Madden '94* on at home, and people have actually come in and said, 'Is this the Superbowl?' when they've seen it. It's that gloss, it's making it bigger than life; but the gameplay is still there.

Edge So you'll be taking a 'multimedia'-style approach?

ML Our very first software was 'interactive multimedia' – it had audio, it had video, it had interaction. All we've done is upgrade

that to more of what the consumer's used to, because we finally have the graphical and audio capability in a machine that we can put into their living room. If you're playing football, it's hard to imagine yourself as a bunch of 16-colour sprites; it's much better to show what we see on TV every Saturday or Sunday – football players playing football. The closer we come to that, the more we get the consumer to suspend their disbelief and feel totally comfortable in the newly created interactive world.

Edge And 3DO will be able to achieve all this?

ML Technically, 3DO is absolutely the right hardware for

the job. The question remains – for now – is the pricepoint right for the consumer? But the hardware's capabilities are undeniable.

Edge So 3DO is here to stay?

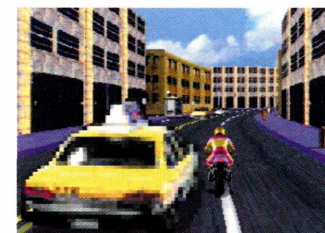
ML I certainly hope for the consumer's sake that people recognise the value of a standard, and the value of letting technology catch up with the human experience a little bit. I can't answer 'Is 3DO here to stay?' That's absolutely in the control of the hardware manufacturers, and it's a tough world out there. But EA is certainly committed to supporting the system, and designing great software on it, and will continue to do so as it grows in the marketplace.

NTSC import machines have been

retailing for between £650 and £700 over here, but the recent reduction in price – the FZ-I multiplayer has been reduced from \$699.99 to \$499.95 – should be passed on. Imported games cost in excess of £50, with 'edutainment' titles coming in at the £40 mark. The **Edge** Directory at the back of each issue carries advertisements from a number of specialist retailers, many of whom have machines currently in stock. The FZ-FVI Video CD adaptor will become available in the Spring, with a suggested retail price of \$249.95.

Anybody planning to buy an imported console should be aware that they will not work with PAL televisions; if you don't have a multi-sync TV or monitor then you'll have to invest in a specially constructed box to convert the NTSC S-video output to RGB Scart. These are available from MD consoles on 0384 480046 and TDS Trading on 081 769 6401.

An official 3DO UK release is planned for May, with the console priced well under £500, and possibly breaking the £400 barrier. First titles will all be NTSC running in a letterbox display on PAL machines.



Electronic Arts have brought that 'being there' feeling to the 3DO versions of *Road Rash* and *FIFA International Soccer*

3DO tech specs

Manufacturer: Various

Format: CD (300K/sec)

CPU: ARM 60 32bit RISC running at 12.5MHz

Graphics: Twin 32bit animation engines, able to scale, rotate, warp and texture-map animation 'cels'

Colours: True colour from palette of 16.7 million

Memory: 3Mb

Resolution: 640x480 interpolated

Sound: 16bit DSP: stereo PCM at 44.1KHz

FMV: MPEG1 option



3DO is the brainchild of Trip Hawkins, ex-president of software giant Electronic Arts, and consists of a licensable technology rather than a particular machine.

At present, only the Panasonic REAL (Realistic Entertainment Active Learning) player has been manufactured, but boxes from Sanyo and AT&T are on the cards.

3DO is a CD multiplayer, able to cope with conventional audio CDs, CD+Gs and Kodak Photo CDs, as well as machine-specific games. A digital video add-on will also offer FMV. Other peripherals mooted include a keyboard, a modem and a VR headset.



Atari's 64bit Jaguar represents an exciting leap in technology. But can the games keep up?

By rights, Atari's Jaguar should be the best thing ever. With an utterly unprecedented jump to 64bit technology at an attractive price tag, it should have been accompanied by heavenly choirs, dancing in the streets, and unanimous ecstasy in all quarters of the videogame industry. US sales appear to be living up to expectations – Atari reckon that well over 30,000 units have shifted States-side, and are projecting sales of 500,000-750,000 by the end of the year – but there are still a lot of people who remain sceptical about Jaguar's long-term future. Why?

There seems to be three major objections. The first – that Atari do not have the marketing muscle or track record to launch such a high-profile product internationally – is contradicted by the rabid response to the console from the games-buying public, both in the US and the UK. It appears that the hardware is exciting enough to sell itself.

The second – that the number and quality of available games is too low to sustain people's interest – is undeniable, but is hardly an indictment of the hardware; new machines have always floundered in this way. If nothing better than *Cybermorph* has appeared by Autumn, though, Atari should be very worried.

But there is one question mark over the Jaguar that

cannot be so easily passed off. Underneath all the gloss and sparkle, there's nothing really new. 16.7 million colours are all very well, but when all you're getting are 16.7 million shades of shoot 'em up or platform game, the prospect begins to seem rather less enticing. While Atari are content to let 3DO take the risks with CD-ROM and the multimedia dream, such a reluctance to commit themselves to innovation outside that of sheer performance may well leave them isolated.

Only one thing is certain – that the Jaguar contains some exciting technology at a very reasonable price. If it ever gets used to its full potential, it'll knock your socks off.

The software, however, has

temporarily stalled the Jaguar's progress. Granted, *Cybermorph* is very impressive, if a little lacking in depth once the novelty has worn off, but subsequent releases have either been delayed or rubbish. The latter category includes the graphically delightful *Crescent Galaxy*, let down by vexing and rudimentary gameplay, the dated and unimaginative *Raiden* and the similarly unoriginal *Evolution Dino Dudes* (Humans by any other name).

Much is riding on *Aliens Vs Predator*, then, a first person perspective shoot 'em up from Rebellion Software, and *Chequered Flag 2*, a racing game developed from the old Lynx title. Both of these games are eagerly anticipated, along with an updated version of the classic Atari coin-op, *Tempest 2000*.

'It's the world's most powerful

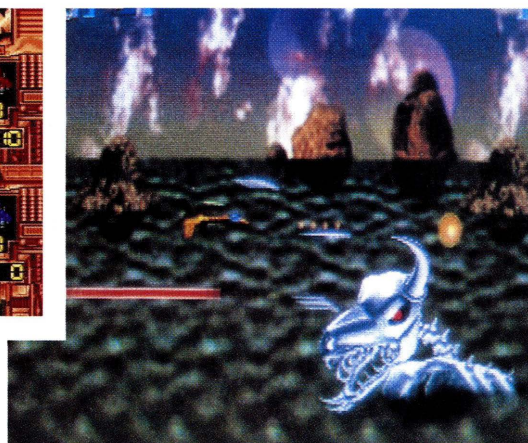
videogames machine. That's

how we'll make money on it'

Richard Miller, Atari's vice-president of engineering



Raiden is slick enough, but the lacklustre gameplay fails to excite



Crescent Galaxy was a real disappointment. Smart graphics failed to mask an archaic and frustrating shoot 'em up

← But whilst the immediate future is not so bright, a large number of third party developers have titles of stunning potential up their sleeves. With brilliant games like *Alone In The Dark*, *Another World* and *Flashback* slated for the system, any judgement on the Jaguar is going to have to wait until these classics get the 64bit treatment. Id Software are scheduled to bring out a Jaguar version of *Doom* this July, and anyone familiar with the superb PC version knows just how exciting that could be.

Attention To Detail are the developers behind *Cybermorph*, the Jaguar's finest game to date. They are currently working on two new titles – *Battlemorph* and *Blue Lightning*. **Edge** quizzed Project Manager **Chris Gibb** about the new machine...

Jaguar tech specs

Manufacturer: Atari

Format: Cartridge with 8x JPEG compression. 300K/sec CD drive appearing later

CPU: Motorola MC68000

Graphics: Two custom 64bit RISC processors; high-speed Blitter GFX chip with hardware support for Z-buffering and Gouraud shading; custom graphics processor with 27 Mips

Memory: 16 Mbits RAM

Colours: True colour from palette of 16.7 million

Sound: DSP with 16bit DAC

Resolution: up to 720x576

FMV: CinePak; MPEG1 option before end of '94



With two Atari-designed 64bit RISC processors – amusingly named Tom and Jerry – at its heart, and a Motorola 68000 co-ordinating the data flow, the Jaguar is roughly on a par with a high-end PC. For the price, this is extremely impressive – although the Saturn and PS-X, despite being 32bit machines, are vastly more powerful thanks to potent custom hardware.

At present, Jaguar is a cartridge-only beast, with JPEG-assisted ROM compression. Specialised graphics chips can handle realtime rendering of 3D shaded polygons, as demonstrated by ATD's entrancing *Cybermorph*.

Edge What can we expect to see as programmers become more familiar with Jaguar's capabilities?

CG To be able to write routines that we know cannot be bettered later on – that are really doing the chipset justice – will take a year or two. The routines that drive the games will go through several iterations of optimisation. In other words, the things will just go quicker.

Edge How will this improve the games?

CG It basically just improves the frame rate, but people want to do something different. In *Battlemorph*, we're using that extra speed – the time that we've saved – to include texture-mapping.

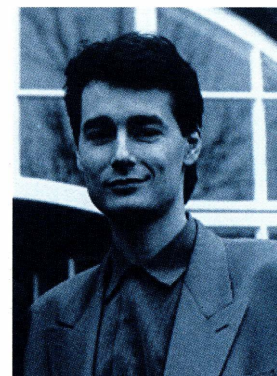
Edge Is Jaguar a multimedia machine, or a games console? Can it be both?

CG Jaguar is here right now, and therefore it's having to deal with the market we have right now. It's been proved by people like Philips, and Commodore with CDTV, that the market isn't there for a 'multimedia machine' concept, whatever that might be; people haven't taken it up in their droves. So the Jaguar is definitely aimed at the gamers of today.

Edge What is Jaguar's greatest strength?

CG The ratio between its power, and what you have to pay for it. That, I think, is going to make the difference in the marketplace, and that's why I'm someone who's prepared to put their name behind the machine. The fact that Jaguar is a cartridge-based machine, with CD as an option, is very important. I really do think that the market for cartridge-only games will remain a strong one, although there is a place for CD. That's more of a longer-term option; it depends when the prices of the product come down – the cost of CD hardware is just too expensive. So the strength of the Jaguar is that, technology-wise, it's a cut above the current consoles, and – okay, it's going to have its hands full when new consoles come along next year – but the price is the thing that's going to make it.

Atari's 64bit console should retail for £230 when it finally gets an official release in this country (probably around June, but it could be later). At the moment, imported machines are extremely scarce, as stocks are being devoured by a hungry US market. If you can find an imported console (try the **Edge** directory) expect to pay between £270 and £300 for it, with imported carts setting you back a mere £45. The CD-ROM drive is due to cost in the region of \$200, which will probably convert to a hefty £200.



Chris Gibb, co-founder of **Attention To Detail**



ATD's *Cybermorph* stands head and shoulders above the currently available Jaguar software



Edge supplement

CD32



Can Commodore's console cut the mustard with the big boys?



D32 was the world's first 32bit console. Commodore fulfilled the promises of other manufacturers – 32bit architecture, CD-ROM drives and digital full-motion video – while the other manufacturers were still making those promises. Arriving on the high street shelves late last year and sporting a very reasonable sub-£300 price tag, CD32 appeared to be a considerable coup for Commodore, and an embarrassment to its louder-mouthed competitors.

The crunch came, as always, with a lack of software. True, the initial drought of titles has been somewhat alleviated, but almost all of the CD32's games have been enhanced versions of successful Amiga titles. Games like *Zool*, *Pinball Fantasies*, *Trolls* and *Robocod* have all been seen elsewhere, although they now feature improved music, the odd extra level and some flashy intro animations.

That's not to detract from the quality of these games – in their time, they were all fine products – but the situation has left users waiting for something just a little bit original to come along. Unfortunately, the chances of that happening are receding, with developers flocking to support the intimidating prodigies of Sega, Sony and Nintendo. In many ways it's a shame; and there are a lot of

people who'd like to see Commodore succeed. Sega and Sony, however, seem to have other ideas...

By far the most startling piece of software for the new machine has been Mindscape's *Liberation: Captive II*, a three dimensional scrolling adventure with colourful texture-mapped graphics and real depth to the gameplay. It's huge, complex and intriguing – if a tad inaccessible – and puts the CD drive through its paces as it exploits all the capabilities of the medium.

Other projected titles for the console include *TFX*, *Frontier*, *Theme Park*, *Total Carnage*, *Wing Commander*, *Rise Of The Robots*, and *Mega Race*. Although there's nothing there that's unique to the CD32 in the way that *Liberation* was, all are likely to be impressive. But will that be enough?

The CD32 retails for around £299 in most high-street electrical stores, although there are rumours that the machine will be reduced to £200 at some stage this year. The MPEG compatible digital video peripheral costs just under £200, and is now widely available.

One of the system's most attractive features is the price of its software. While other manufacturers are keeping the cost of CD titles on a par with expensive console cartridges, most CD32 games are enticingly priced. Team 17, for example, have released a series of titles for £14.99, and Renegade are selling games like *Sensible Soccer* and *The Chaos Engine* for £24.99.



'It's a very nice piece of kit, and

I think it points the way

forward to the birth of a

complete home entertainment'

Keith Smith, Millennium Software



Guardian and Liberation are fine games that have both premiered on the CD32 before the A1200

CD32 tech specs

Manufacturer: Commodore

Format: CD (300K/sec)

CPU: 68020, running at 14MHz

Memory: 2Mb

Colours: True colour from palette of 16.7 million

Graphics: AGA chipset

Resolution: 320x256 – 1,280x512

Sound: Stereo four-channel 8bit

FMV: MPEG1 option

Expansion: Keyboard socket and floppy drive port



Basically, the CD32 is an Amiga 1200 computer without a keyboard. A double-speed CD-ROM drive replaces the floppy drive. The 32bit 68020 architecture is already starting to look jaded in the light of some stiff competition, and the 256-colour display limit seems particularly restricting.

As it stands, CD32 can play audio CDs, CD+Gs and most existing CDTV games, as well as the titles written specifically for the machine. Support for Photo CD has not yet been implemented, but the addition of a digital video cartridge brings compatibility with MPEG-encoded FMV discs.

CD-i



Will the advent of Video CD be enough to rescue CD-i?

Philips launched CD-i (Compact Disc Interactive) in 1992, a mass-market proposition well before 3DO took to the stage and claimed to break new ground. Right from the start, though, two major problems conspired to crush its aspirations. Firstly, the software was of a generally poor quality and almost impossibly difficult to come by; a situation exacerbated by a highly optimistic release schedule.

Secondly, and crucially, nobody really understood what it was. Fine, so it would play audio compact discs, but so would any CD player that cost £300 less. None of the available games grabbed anybody's imagination when they were being distracted by Nintendo's Super FX chip and Sega's Mega CD, and all you were left with were an 'interactive encyclopaedia', a few kids' titles and dull explorations of opera and cookery.

Further hamstrung by a slow CD drive – machines that pull data twice the speed are having problems with the medium – CD-i seemed to have little chance of success.

With the advent of the digital video cartridge,

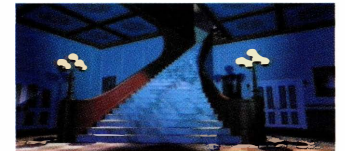
however, a more attractively priced machine and Philips' re-evaluation of their approach to games software, CD-i suddenly seems to have a chance. Philips claim to have sold over 300,000 players to date, and are aiming for a user base of 1,000,000 by the end of the year. Major developers are beginning to take much more of an interest in the format.

Nonetheless, there's a lot of ground to be made up, and with 3DO striding purposefully ahead, it's going to take a remarkable effort from Philips to turn CD-i into an attractive proposition. An effort that might produce CD-i 2, for instance...

The lack of quality games, more than anything, has been holding back CD-i's development in the marketplace. Last year's top-selling titles – *Palm Springs Open*, *International Tennis Open*, *Tetris* and *Battleships* – were hardly brimming over with originality, and even the more interesting adventure games – *Kether* and *Inca* in particular – were rather limited.

Hope looms, however, with the imminent release of *Rebel Assault*, *The 7th Guest*, *Lemmings*, *Microcosm*, *Striker* and – shock, horror! – a decent version of *Mad Dog McCree*. In addition, CD-i has been graced with a number of music video albums, and will soon play host to Peter Gabriel's interactive multimedia project *Xplora 1*.

The Philips CD-i 210 player is a sleeker version of the old 220, and is currently retailing in most high-street electrical stores for just under £400. Amstrad are likely to launch their own CD-i player later this year, at a competitive price suggested to be around £300. The FMV cartridge costs a further £150, and whilst initial supplies were very limited, shortages should have been resolved by now.



The 7th Guest, Kether and Inca (from top) – all good looking games but lacking in playability

'It does so many things... CD-i is the benchmark by which all other systems will be judged'

the benchmark by which all

other systems will be judged'

Simon Turner, Director, Philips IMS UK

CD-i tech specs

Manufacturer: Philips

Format: CD (150K/sec)

CPU: 68070, running at 15.5 MHz

Graphics: Various modes

Colours: True colour from palette of 16.7 million

Memory: 1.5Mb

Resolution: 384x280 – 768x560

Sound: ADPCM eight channels

FMV: MPEG1 option



The Philips CD-i machine can play standard audio CDs, proprietary CD-i discs and, with the addition of a digital video cartridge, Video CDs. Picture quality on Digital Video CDs is comparable with good VHS, and the technology supports a perfect freeze-frame, variable speed slow motion and the instant skip to indexed scenes. In addition, the DV cartridge will play FMV games like *The 7th Guest* and *Microcosm*.

Current Video CDs contain up to 74 minutes of footage, so discs have to be swapped halfway through a movie. A carousel player should appear later this year.

Edge supplement

Saturn



Sega are finally ready to take us to 'the next level', with their advanced 32bit Saturn

Project Saturn currently occupies a highly enviable status, tucked alluringly between fact and fiction. In its unreal state, Saturn has attained a semi-mythological status, and remains unaffected by the problems that have tarnished the promises of 3DO and Jaguar – after all, there cannot be a shortage of quality software for a machine that does not yet exist.

'It's very hot. Saturn is

basically just a spin-off from

Sega's coin-op technology'

Unnamed developer

At the same time, however, tangible proof of the system's capabilities is abundant. The speculation and rumour may seem like nothing more than empty hype, but every time you see a screenshot of *Daytona GP*, or treat yourself to a game of *Virtua Fighters*, that little Saturn voice will be whispering 'I could do that' in your ear. Sega's arcade games have already proved that the company has the ability to make the Saturn dream come true. That knowledge, coupled with a heady aura of mystique and uncertainty about the precise nature of the home machine, is what makes their box the most exciting of all. And Sega

are known to be improving the capabilities of their graphics co-processor, to rival that of the PS-X.

In the meantime, project Mars will provide stopgap relief, placating owners of 16bit hardware and preventing them from defecting to a rival machine before the Saturn arrives. The device connects to the cartridge port of the Mega Drive, and is fully compatible with the Mega CD and Multi Mega (CD-X). According to early reports, Mars will probably feature Hitachi's 32bit SH2 processor.

Sega may have failed with the half-baked Mega CD, but their dominating international profile and pioneering commitment to push back the boundaries of videogames with projects like the Sega Channel almost guarantees Saturn's success. With the technology already acclaimed in the arcades, Sega are going to have to do something very wrong indeed to mess this one up.

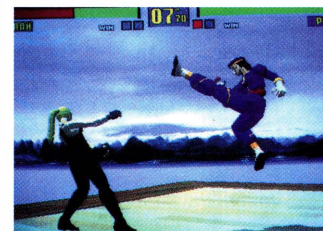
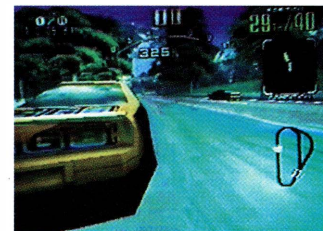
The only officially announced games for the new machines are *Virtua Fighters*, *Virtua Soccer*, a '3D shooting game' and an 'action game', but conversions of *Daytona GP* and the *Sonic* coin-op are also under way. Game Arts, creators of Mega CD hits *Silpheed* and *Lunar: The Silver Star*, are developing a 3D shoot 'em up and an RPG, but many more developers are expected to confirm commitment shortly; Sega would have us believe that work has started on over 40 titles.

Saturn is currently slated for a Japanese release in December, but no-one will be too surprised if this turns out to have been unreasonably optimistic. A brand new Saturn will set you back ¥50,000 (£310). There's no news as yet of a UK release date, but we're unlikely to see official kit until well into 1995. Mars will cost between \$80 and \$100; UK pricing is undecided.

E

Saturn is based on the technology seen in the *Virtua Racing* and *Virtua Fighters* coin-ops, and developed for the home with the help of Hitachi and their 32bit SH2 chips. It will have at least a double-speed CD ROM drive.

The Japanese Saturn will be compatible with HDTV (High Definition TeleVision) MUSE systems, and will be able to display a wide screen (16:9) image. Rumours of a virtual reality headset and voice-recognition system remain unconfirmed, and it's unclear whether MPEG FMV on the Saturn will be fitted as standard or available as an option.



Daytona GP (top) and *Virtua Fighters* are easy conversions to a machine as powerful as Saturn

Saturn tech specs

Manufacturer: Sega

Format: CD (300K/sec)

CPU: Two Hitachi SH2 32bit RISC chips running at 27MHz/50MIPS

Co-processing: Hitachi SH1, 24bit DSP, Motorola 68000, video processor

Memory: 36Mbits

Colours: True colour from palette of 16.7 million

Graphics: 900,000 polygons/sec; Gouraud shading, texture-mapping. Custom sprites and scrolling engine; scaling and rotation

Sound: 16bit 68EC000, PCM 32 channels, FM eight channels



Sony PS-X



Illustration: Paul Kiddy

Can Sony consolidate their grip on the entertainment industry with the 32bit Play Station-X?

If you were forced into staking a large sum of cash – around £350, say – on the videogame format most likely to succeed in 1995, you'd be hard pressed to find a better bet than something created by a vast multinational consumer electronics conglomerate, with an annual turnover in the region of a cool £20 billion. Something like the PS-X, in fact. Sony's bid to add control of the videogame industry to its still-developing entertainment empire should arrive in Japan by the end of this year, reaching these shores halfway through the next.

The technical details that have so far emerged tell of a console of unprecedented speed and power, capable of reproducing state of the art arcade machines with almost frightening ease. A 32bit RISC CPU is supplemented by a custom graphics chip called the 3DGE (3D Graphic Engine), able to juggle a bewildering 360,000 polygons simultaneously, and to cope with 4,000 hardware sprites.

But it's not just the awesome hardware that makes PS-X the machine to watch; the simple fact that it's produced by Sony could be enough to ensure its success. Apart from all the marketing muscle and brand status you'd expect from such a backer, the Sony empire will also be able to supply some powerful allies from throughout the entertainment industry. With the acquisition of companies like Columbia, CBS and Psygnosis, Sony has a finger in all the juiciest slices of the multimedia pie. By

bringing out their own console, they might just be able to appropriate the dish, table and maybe even the entire dining room as well.

Apart from Sony's in-house development teams, of whose work we have so far seen only tantalising glimpses, Japanese giants Namco and Konami are the only software companies to have officially confirmed support for the system. Capcom are rumoured to be about to make an announcement, and many other companies, some based in the UK, are thought to be working with development kits, but are prevented from talking about the PS-X due to complex non-disclosure agreements made with the manufacturers.

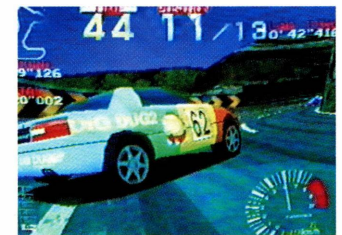
Namco's involvement, however, is very significant, responsible for both *Galaxian*³ and the astounding *Ridge Racer*, two extremely innovative and successful arcade machines. *Ridge Racer* is now a definite candidate for PS-X; and if reports are to be believed, the hardware will be able to manage an almost exact conversion of this stunning texture-mapped racing game.

Sony are hoping to launch their PS-X in

Japan before Christmas, with a European release mid-1995. No price has been set, but with Sony's enormous resources brought to bear on such a prestigious product, and considering their first year sales targets of 3,000,000, we can expect something competitive – £350 is a fair ballpark figure. **E**

It's early days yet for Sony's Play Station X, but some remarkable details have already been revealed. Based on a 32bit RISC CPU running at 33MHz, it's being pitched as a games console first and foremost, but will have the capacity to handle the most demanding of multimedia applications, should the markets emerge for them.

Sony have put their faith squarely in the Compact Disc, and the machine will certainly be able to handle digital video discs, but it is not yet clear whether MPEG decoding will be fitted as standard or offered as an optional extra.



Namco's *Ridge Racer* coin-op is set for a PS-X conversion

'It's going to revolutionise the

way computers are at the

moment... it's awesome'

Unnamed developer

Sony PS-X tech specs

Manufacturer: Sony

Format: CD (unconfirmed, but at least double speed)

CPU: 32bit RISC chip (R3000A) running at 33 MHz, with a clearing capacity of 30 MIPS and a bus bandwidth of 132Mb/sec

Graphics: 3DGE custom polygon generator, with a clearing capacity of 66 MIPS. Capable of generating 360,000 texture-mapped and light-sourced polygons per second. Custom scrolling and sprite engine with a maximum of 4,000 sprites onscreen

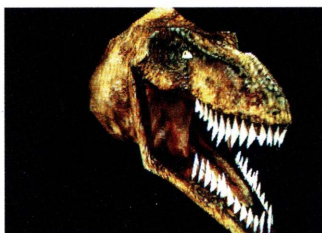
Data Compression Engine: JPEG/MPEG, with a clearing capacity of 80 MIPS

Colours: True colour from palette of 16.7 million

Memory: 5Mb internal RAM; RAM cards for status/high score save

Resolution: 256x224 – 640x480

Sound: 16bit stereo ADPCM at 44.1KHz

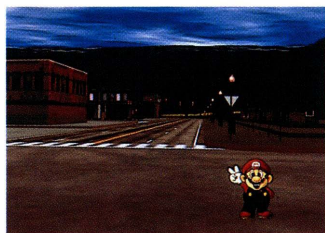
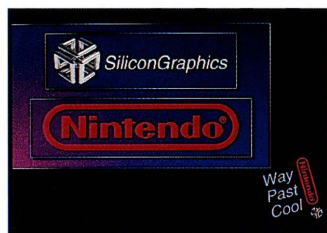


The two demonstrations of PS-X – a joypad controlled the action of the T-Rex's jaws, in real time

Project Reality



Project Reality: hot stuff or hot air? **Edge** investigates...



The ubiquitous plumber is bound to put in an early appearance on the new Nintendo machine

Nintendo Of America announced that they were to team up with workstation supremos Silicon Graphics back in August of last year. The fact that this launch took place alongside 3DO's publicity offensive was undoubtedly co-incidental; the mighty Nintendo would surely be above attempting to discredit a rival format by promising their own superior system and then failing to deliver the goods. That's exactly what they did with the SNES CD-ROM, of course, when Sega announced their Mega CD, but it would be a pretty transparent trick to pull twice in a row.

Regardless of precedent, news of Project Reality (as the collaboration is known) managed successfully to capture everybody's attention, with some quite astonishing promises. 'Nintendo and Silicon Graphics plan to develop a truly three dimensional 64bit interactive entertainment machine that will enable players to step inside realtime 3D worlds,' gushed the press release. The conjuring power of the magical phrase '64bit' was enough to make even the sleepest of onlookers sit up and take notice, but it was

only when the target specifications for the machine were revealed that the breathtaking ambition of the projected technological leap became apparent.

The 64bit RISC CPU will be clocked at a speed greater than 100MHz, and its processing capacity will exceed 100 million instructions per second. Compatibility with HDTV means that Project Reality's graphical resolution will exceed that of a standard television picture. The potential of a console with those kinds of capabilities is, shall we say, rather exciting?

Industry sources suggest that the

first arcade game we see will be

some kind of 3D shoot 'em up,

with *Legend Of Zelda V* heading

up the software onslaught for the home console. There's

talk of a Project Reality *F-Zero 2*, and suggestions that

major Japanese developers

Square Soft are working on

Final Fantasy VII, for a 126Mbits

cartridge. It's nigh-on inevitable, of course, that Nintendo

icon Mario will be dusted off for a new outing, probably in

a 3D extravaganza. The mind

quite literally boggles.

Any indulgent parent or profligate

techno-freak should be able to 'pick up' a Silicon Graphics

Indy workstation (pictured) for

£4,350. Amazingly, Nintendo

plan to retail the scaled-down

home version of this technology for under \$250.

The first fruits of the Nintendo/SG collaboration

should appear in the arcades this year; the domestic

machine is scheduled for 1995, although Nintendo

reckon they're six months ahead of schedule.



The graphical prowess of a Silicon Graphics workstation is unrivalled

'This dissolves the current

limits of video play, causing the

world to challenge its notions

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of what a video game can be'

Howard Lincoln, Senior Vice-President, Nintendo

Project Reality tech specs

Manufacturer: Nintendo

Format: Cartridge – at least 100Mbits capacity

CPU: R4200 MIPS RISC, with a clock speed in excess of 100 MHz

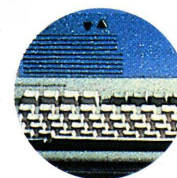
Graphics: Realtime anti-aliased texture-mapping of 100,000 polygons per second

Graphics: True colour from palette of 16.7 million

Display: High-resolution HDTV

Sound: CD quality

FMV: Unknown



At the heart of Project Reality will be a 64bit RISC processor developed by MIPS Technologies, a subsidiary of Silicon Graphics, and backed by a number of as yet undisclosed custom graphics and audio chips. The CPU is likely to be a hybrid of the R4000 chip found in Silicon Graphics' entry-level Indy workstation (which runs at 100MHz) and the even more advanced 150MHz R4400 found in the Onyx.

Wary of CD, Nintendo are using 'cutting edge silicon technology' to develop cartridges with a capacity of up to 100Mbits, which will sell for the same price as 16bit carts.

So what?

This, then, is the situation. 16bit systems are on their way out, and there are three successors on the horizon – from Sega, Sony and Nintendo – that seem to have the necessary muscle to replace them. None of these machines, however, is going to be available in this country until some time next year. In the meantime, the debate over the future of videogames rages on, with the Jaguar and 3DO fighting tooth and nail, and the CD³² caught somewhere in the middle.

Commodore's machine, whilst being an interesting piece of kit at a very reasonable price, seems unable to break away from the 'home computer' image of its Amiga brethren and make the transition into the style-conscious world of the consoles. Of course, support for the format will be maintained in some form or other – it will certainly have its devotees – but when it comes down to international and cultural domination, Saturn and PS-X are going to stomp all over it.

The 3DO and Jaguar are both pulling in different directions, and either one, if it proves itself, could still have a chance to surprise the cynics and succeed in the face of heavyweight opposition. While the former is proclaiming the dawn of a new age of home entertainment, all MTV-style multimedia and Hollywood

glitz, the big cat remains cautious. The Atari marketing machine remains confident that the age of CD-based interactive multimedia is not yet upon us, and that Trip Hawkins has asked too much too

soon. Certainly, rumours from America suggest that the 3DO has performed well below expectations, due mostly to the failure of any software to have convincingly taken advantage of the system's capabilities.

But the 3DO is receiving new boosts all the time. A recent slew of quality product from Electronic Arts, coupled with news of the \$200 price slash, has shortened the odds, especially when pitched against the fact that Jaguar will be retailing for rather more than the measly £200 Atari promised us before Christmas.

The tussle seems to be too close to call at this early stage. When both consoles are released officially, and we see key products like the Jaguar's CD-ROM drive, and the PC-card and digital video add-on for the 3DO, a leader will no doubt emerge.

Ultimately, though, the winners will be selected by the consumer. We've collated the specifications of each machine, and explored some of the directions in which the market could travel, but everything comes down to the moment in the shop when you play *Crash 'n' Burn*, then *Cybermorph*, and decide which you prefer.

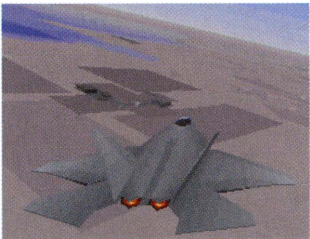
This is, ideally, the way it should work. After all, nobody is interested in a piece of hardware, however sophisticated it may be, if there's no fun to be had from its games. So play them, and buy the machine whose games you like. If you don't really like any of them, stick with what you've got and wait for the next wave to improve.

Something better – bigger, faster, smarter or cooler – is always going to be just around the corner. The trick is to pick a system that is going to grow; whose popularity and success bring support for your investment even when newer machines arrive. It's not yet clear which format is going to win that mass-market acceptance, and the prudent course of action might be to sit on the fence and nurture your SNES or Mega Drive for a little while longer. But leaders will start to emerge in the near future.

With the help of this supplement – and the continued efforts of **Edge** to monitor the market – you should be able to choose wisely. Good luck.



Cybermorph and Total Eclipse – play the games, then buy the machine whose games you like



Even the admirable TFX is unlikely to give the CD³² the mass-market appeal of, say, a new Sega machine

The new champions

	Manufacturer	Architecture	Format	Styling	Software	Prospects
3DO:	Various	32bit	Compact Disc	Squat	Becoming impressive	Has potential, and some influential backers
Jaguar:	Atari	64bit	Cartridge/CD	Peculiar	Disappointing	Success would come as a pleasant surprise
CD ³² :	Commodore	32bit	Compact Disc	Unconvincing	Unoriginal	Should do well with Amiga fans
CD-i:	Philips	16bit	Compact Disc	Mundane	Limited	An uphill struggle for an outmoded machine
Saturn:	Sega	32bit	Compact Disc	Sexy	State of the art	Very strong indeed
PS-X:	Sony	32bit	Compact Disc	Sexier	Looking good	Unlimited – remember the Walkman?
Project Reality:	Nintendo	64bit	Cartridge	Nintendo	Could be anything	Impossible to say, but the promise is enormous

Be prepared for change. Videogames are about to enter an unexplored maze of new technologies

This supplement will guide you through the turmoil to come

It profiles the machines that purport to represent the future of videogames

It analyses their chances of success

It will help you to decide what your next console will be

Without it, **you'll be lost**

EDGE

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